WHAT IS CLAIMED IS:

1. A method for manufacturing an organic molecular device, comprising the steps of:

(a) forming a lower electrode on a substrate;

(b) forming a predetermined size of a sacrificial layer pattern on the substrate including the lower electrode;

(c) forming an upper electrode on the substrate including the sacrificial layer pattern;

(d) removing the sacrificial layer so that a nano gap is formed between the lower electrode and the upper electrode; and

(e) adsorbing conductive organic molecules between the upper electrode and the lower electrode in the nano gap

2. The method according to claim 1, wherein the substrate is made of a resistive insulating material.

3. The method according to claim 1, wherein an insulating film is formed on the substrate.

4. The method according to claim 1, wherein the lower and upper electrodes are formed by steps of:

forming a polymer pattern using an electron beam etching technique;

removing metal on the polymer pattern in a liftoff process after

depositing the metal on the entire upper surface; and

removing the polymer pattern.

5. The method according to claim 1, wherein the sacrificial layer pattern is formed in a part at which the lower and upper electrodes intersect.

6. The method according to claim 1, wherein the sacrificial layer pattern is formed of an organic material, an oxide film or metal, which has a selective etching characteristic with the substrate, the sacrificial layer pattern being formed in a nano-meter thickness.

7. The method according to claim 6, wherein the sacrificial layer pattern is formed of the organic material, the oxide film or the metal of a multilayer structure having different etching selection ratios.

8. The method according to claim 1, wherein the nano gap is formed so that vertical and horizontal distances thereof are asymmetric, the horizontal distance being larger than the vertical distance.

9. The method according to claim 1, wherein the conductive organic molecules are adsorbed while the substrate is immersed in a solution in which the conductive organic molecules are dissolved.

10. The method according to claim 9, wherein an electric field is

applied between the lower electrode and the upper electrode on the substrate.

11. The method according to claim 9, wherein the solution is stirred or heated.

12. The method according to claim 1, wherein when the conductive organic molecules are adsorbed, a current flowing through the lower electrode and the upper electrode is sensed so that whether and how much to adsorb is observed.

13. The method according to claim 1, further comprising a step of passivating an exterior with the insulating film after the step (e).